PROCEEDINGS

OF

THE ROYAL IRISH ACADEMY.

1839. No. 15.

January 28.

SIR WM. R. HAMILTON, A. M., President, in the Chair.

Mr. Ball read a paper on the Remains of Oxen found in the Bogs of Ireland.

Having alluded to the occurrence of fossil remains of oxen in Britain, and the existence of the Auroch or Wild Ox, in some parks in that country, he remarked on the old and generally received opinion, that Ireland could not furnish any evidence of having ever possessed an indigenous ox; and he stated, that a specimen which he received from the sub-marine forest, in the Bay of Youghal, seemed to have been the core of a horn of the fossil ox, often found in Britain, and supposed to have been the Urus; but this specimen having been lost, he alluded to it, to direct the attention of the Academy to the subject, in the hope of having his view confirmed. He then entered upon the principal object of his paper, which was to show, that the remains of oxen found at considerable depths in bogs in Westmeath, Tyrone, and Longford, belonged to a variety or race, differing very remarkably from any noticed in Cuvier's "Ossemens Fossiles," or any other work with which he was acquainted. He concluded by expressing a conviction, that Ireland had possessed at least one native race of oxen, distinguished by the convexity of the upper part of the forehead, by its great proportionate length, and by the shortness and downward direction of the horns. As this fact seems to have escaped altogether the notice of

British and continental naturalists, and as analogy in the case of other Irish mammals justified the view, he urged the great probability of the race in question proving to be one peculiar to Ireland.

Mr. Ball exhibited specimens and drawings, and solicited the co-operation of Members of the Academy, in effecting a perfect elucidation of the subject, by collecting specimens from the bogs of the country.

Dr. Kane read an account of a substance which has hitherto been confounded with white precipitate. It is formed by precipitating in the cold, a solution of sal-alembroth by carbonate of potash, or by boiling true white precipitate in a strong solution of sal-ammoniac. The composition of this body is expressed by the formula $Hgcl + NH_3$, and Dr. Kane considers it as intermediate between true white precipitate and sal-ammoniac.

This substance was noticed independently by Professor Woehler, as being found in commerce under the name of white precipitate. He, however, recommended it to the attention of chemists without analyzing it.

Rev. H. Lloyd, V. P., read a "Note of Observations made during the remarkable Aurora of the 19th inst."

Mr. Lloyd commenced by stating, that the approach of this beautiful phenomenon was indicated in Dublin, at an early hour, by the disturbance of the magnets in the Observatory. At five o'clock, both magnetometers testified the setting in of what Humboldt calls a "magnetical hurricane;" the disturbance in *declination* amounting, in the course of a quarter of an hour, to 20.7 minutes, while the corresponding change in the *intensity* of the horizontal component of the magnetic force, was 0092, or nearly the one-hundredth part of the whole.

Shortly before 10 o'clock, a broad and brilliant arch was

formed, the lower limb of which was beautifully defined. The remarkable feature in this phenomenon was the *intense blackness* of the sky beneath the arch, as contrasted with that exterior to it. The darkness of this space was such, as to resemble a dense cloud, fringed by the auroral light; and the doubt was suggested, whether the *dark cloud* noticed by many observers, in connexion with aurora, may not have been an appearance of the same kind, though less regular in its outline. In the aurora of the 19th, the blackness of the space enclosed by the arch was certainly not due to the presence of a cloud, for the stars were distinctly visible in it. Mr. Lloyd stated, that he was so much interested in this part of the phenomenon, as to lose the opportunity of obtaining a measure of the altitude of the arch.

Soon after 10 o'clock, the arch began to break up into streamers. Its appearance at this period was such as is represented in the subjoined sketch.

From this time, until half past eleven o'clock, Mr. Lloyd took no notes of the appearances, having been engaged in

watching the motions of the magnetometers in the Observatory.

At half-past eleven o'clock, the streamers were very splendid, and covered the whole sky, appearing to spring, however, chiefly from the N. E. They were remarkable for the intensity of their light; the irregularity of their forms (seldom affecting the usual rectilinear form;) and their incessant dancing motion. At first, the flashes of light appeared in broad irregular masses, at considerable intervals over the sky, like scattered clouds illuminated by the moon, except that their appearance was momentary; or (as they have been described) like the jets of illuminated vapour, shot from the boiler of a locomotive engine. About twelve o'clock, they spread themselves over the face of the sky, and exhibited a nearer approach to their usual form. At this period, a distinct point of convergence, a little to the S. E. of the zenith, was occasionally exhibited; and a marked contortion of the auroral clouds, at this point, showed the tendency to the formation of the *corona*. There was likewise a stationary luminous cloud, to the S. E., which appeared to be connected with the phenomenon.

After twelve o'clock, the brilliancy of the phenomenon in the upper part of the sky gradually lessened; but a very intense auroral light, with streamers, still remained in the N. W. The atmosphere was remarkably clear, and the stars very bright; the cloud-like patches of the aurora not seeming to present any obstacle to the transmitted light. There was a cold cutting wind, which came in gusts; and it seemed as if these gusts were simultaneous with the flashes of the aurora.

Mr. Lloyd then presented a table, exhibiting the results of observation with the two magnetometers, one of which measures the changes of *declination*, and the other those of the *horizontal* part of the earth's *magnetic force*. The observations commenced at $10^h\ 25^m$, and were continued, at intervals

of three minutes, for one hour. The table contained the direct results of observation with the two instruments; the differences of these results and the means of the day, (or the *disturbances* in declination and horizontal force,) estimated in parts of the scale; and the same differences reduced to their proper measures. The extreme disturbance in declination, amounted to 17′.9; and that of the horizontal force to .0127. The changes of the horizontal component of the force arising partly from changes of the *total force*, and partly from changes of *inclination*, and the part due to the latter being, in high magnetic latitudes, much the greater, it is manifest that the changes of inclination may be deduced, approximately, from those of the horizontal force, on the assumption that the actual force remains unvaried. The changes of inclination, thus deduced, were given in another column of the table.

The numerical values of the changes of declination and inclination thus obtained, were laid down in charts, so as to represent graphically the progress of the disturbance of each of the elements of the magnetic direction. In a third chart the combined effect of the two disturbances was represented, so as to exhibit the successive positions of the pole of the needle, supposed free to move in every direction. From this it appeared, that in the present instance, the effect of the auroral disturbance upon the resultant direction of the earth's magnetic force, has been to impress upon the pole of the needle a kind of epicycloidal movement. It will remain for future observations to determine whether or not this is a general law; the light that such an inquiry must throw on the nature of the disturbance need not be insisted on.

The aurora appears to have been frequent about this period. Two days after this observation, on the 21st, at nine o'clock in the evening, the magnetometers were again disturbed. The extreme positions observed, occurred at $9^h\ 10^m$, and $9^h\ 35^m$; and in this interval the change of decli-

nation amounted to 53'.8, while the change of the horizontal force was .004. At the time of this observation, the sky was overcast with light fleecy clouds; but in the course of the evening the aurora was seen.

The following additional notes were furnished by Mr. Bergin.

"The aurora was first seen about half past five o'clock P. M. as a luminous arched bank, on the N. W. horizon, extending about 30° horizontally, and having a versed sine of about 15° vertical, with occasional very thin, luminous, cloud-like patches, stretching to the zenith. It was some minutes before I could be certain, whether it was aurora or only vapoury clouds. About half an hour afterwards, there was a very well defined luminous arch over the bank, and parallel to it, perhaps 10° higher, with motionless streamers from the bank towards the arch. From the summit of the latter there sprung a vertical arch, (very faint,) which extended nearly to the zenith, where there was a faint circular patch (corona?)

"The space between the bank and the horizontal arch was intensely dark; yet that the darkness was not caused by clouds, was evident, as a few stars were distinctly visible within this space. At this time there was a very remarkable brush of light, commencing apparently at the centre star of Orion's belt, diverging southward for 10° or 12°, and slightly inclined upwards: this brush was perfectly motionless, and remained altogether unchanged during an interval of five minutes or thereabouts; my attention was then for a short time directed to the arch, and when I again looked towards Orion, the brush had entirely disappeared.

"About nine o'clock, the horizontal and vertical arches, as well as the coronal patch, had quite disappeared; or rather they had united with the bank first described.

"At half past ten the appearance had again changed,

and presented part of an arch based upon the upper part of another,—this latter throwing out singularly brilliant coruscating streamers towards the zenith, while it rested on luminous clouds, near the horizon, somewhat in this manner:

About twelve o'clock I could only see a luminous cloud, not very extensive, towards the N. W., with the ordinary flashing and playing masses of light.

"The colour of the aurora, when first seen, was slightly reddish, afterwards decidedly yellow; the streamers were occasionally very brilliant and perfectly white."

The subject of the aurora having been brought before the Academy, Dr. Apjohn took the opportunity of describing a very beautiful phenomenon of the kind, which had been observed on the 16th of last September, at Sunville, in the county of Limerick. It was first noticed at about half past eight o'clock in the evening, and did not disappear for very nearly an hour. It was first seen in the southern part of the hemisphere, and consisted of a number of streamers of variable brilliancy, shooting upwards in vertical circles, or, more strictly speaking, converging towards a point which appeared a few degrees to the south-east of the zenith. They did not in any case originate from the hori-

zon, but from points having an altitude of about 40°; and they very frequently extended upwards to their point of intersection, producing there a light of considerable intensity. The illuminated sector of the sky, supposing it prolonged to the horizon, subtended an angle of about 30°. The most remarkable circumstance connected with this aurora was the following. About nine o'clock, it began to move slowly round, taking an easterly direction; and when, in the course of fifteen or twenty minutes, it attained a north-westerly bearing, the sky was lighted up on every side with singular brilliancy. The appearance which now presented itself, is best conveyed by stating, that it was precisely such as would be produced by the extension, *at the same instant,* of the aurora already described, through every point of azimuth. This magnificent illumination lasted only about a minute, but left behind it, very nearly due west, a fasciculus of beams quite similar to those which first attracted attention.

The night was remarkably fine and still, having been preceded by a day of unusual warmth and sunshine. The sky was not destitute of clouds, but they had a considerable elevation, were small and scattered, and were penetrated by the light of the stars, which were visible in considerable numbers.

Mr. George Downes read extracts of a second letter from Professor Rafn, Secretary to the Royal Society of Northern Antiquaries of Copenhagen. In this letter Professor Rafn suggested that, as his researches relative to America appeared to be, as yet, but little known in Ireland, it might perhaps be advisable, that his "Memoir on the Discovery of America in the tenth Century," already published at Copenhagen in the *Antiquitates Americanæ*, should be reprinted in the Transactions of the Academy, with an introduction, which he proposed to furnish, and with some ad-

ditional remarks on " Great Ireland." Professor Rafn took occasion also to solicit contributions of books or money, for a public library which had been established by himself, in 1818, at Reikiavik, the capital of Iceland, " whose inhabitants," he says, " have but little opportunity of gratifying their thirst for information." The library now numbers 7500 volumes, and possesses a permanent fund of 1500 rixdollars, for which it is partly indebted to "some noble-minded Englishmen." With reference to the subject of this letter, Mr. Downes remarked, that the island for which Professor Rafn felt so much interest, had peculiar claims on the sympathy of Irishmen, as having been, like their own island, a place of refuge for literature, when banished from the continent of Europe. He then renewed his application to the Academy for a contribution to the funds of the Royal Society of Northern Antiquaries, observing, that they had shown great readiness to lend their aid in the elucidation of Irish antiquities, which indeed were intimately connected with their own; and that a work, which they now had in contemplation, was specially devoted to the antiquities of Great Britain and Ireland; a work, however, of such magnitude, that it might never see the light, unless a liberal supply could be raised for the funds of the Society.

It was RESOLVED, that Mr. Downes be requested to communicate with the Council on this subject.

RESOLVED,—on the recommendation of Council, that in the By-law, Chap. VIII. Sec. 5. the words " altered or repealed" be inserted after the word " confirmed."

The Secretary of Council stated, that the Council, in consequence of the expressed wish of the Academy, had resolved, " that any alterations in By-laws, proposed by the Council, shall be stated *in full* to the Members of the Academy, together with the existing By-law, so proposed to be amended; and that this notice shall be given *in print*."

DONATIONS.

Comptes Rendus Hebdomadaires des Séances de l'Academie des Sciences. Par. MM. les Sécretaires Perpetuels. Second Semestre, Nos. 26 and 27. Presented by the Academy.

Memorie della Reale Accademia delle Scienze di Torino. Tome XL. Presented by the Academy.

Transactions of the Society of Civil Engineers. Vol. II. Presented by the Society.

Report of a Committee of the Royal Society, on the Propriety of recommending to her Majesty's Government, the Establishment of fixed Magnetic Observatories, and the Equipment of a Naval Expedition for Magnetic Observations in the Antarctic Seas; together with the Resolutions adopted on that Report by the Council of the Royal Society. Presented by the Society.

Rough Sketches, intended to aid in developing the Natural History of the Seals, (Phocidæ) of the British Islands. By R. Ball, Esq. Presented by the Author.

The Expediency and Facility of establishing Metrological and Monetary Systems throughout India, on a scientific and permanent Basis, grounded on an analytical Review of the Weights, Measures, and Coins of India, &c. &c. By Captain T. B. Jervis. Presented by the Author.

The Indian Review, and Journal of Foreign Science and the Arts. Edited by Frederick Corbyn, Esq. Vol. II. Presented by the Editor.

February 11.

SIR WM. R. HAMILTON, A. M., President, in the Chair.

The Rev. Robert Vickers Dixon, F.T.C., was elected a Member of the Academy.